

WE CLAIM:

1. A laser irradiation apparatus comprising:
a light source producing a coherent beam;
5 a first optical unit disposed in an optical path between said light source and a target workpiece; and
a second optical unit disposed in an optical path between said first optical unit and the target workpiece;
wherein said first optical unit is disposed such that an entry point on said
10 second optical unit and a starting point of a pointing vector of the beam of said light source are mutually conjugated with respect to said first optical unit.
2. The laser irradiation apparatus as defined in Claim 1, wherein said second optical unit is an optical beam forming unit.
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3. The laser irradiation apparatus as defined in Claim 2, wherein said optical beam forming unit is an optical element for making the intensity distribution of the beam uniform.
- 20 4. The laser irradiation apparatus as defined in Claim 1, wherein said first optical unit comprises at least two lenses.
5. The laser irradiation apparatus as defined in Claim 1, wherein said light source is a laser oscillator.
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6. The laser irradiation apparatus as defined in Claim 1 further comprising at least a third optical unit in an optical path between said second optical unit and the target workpiece.

7. A laser irradiation apparatus comprising.
a light source producing a coherent beam;
a first optical unit disposed in an optical path between said light source and a target workpiece;
- 5 a second optical unit disposed in an optical path between said first optical unit and the target workpiece; and
 a third optical unit disposed in an optical path between said second optical unit and the target workpiece;
- 10 wherein said first optical unit focuses said coherent beam between said first optical unit and said second optical unit, and a focal point of said second optical unit and an entry point on said third optical unit are mutually conjugated with respect to said second optical unit.
- 15 8. The laser irradiation apparatus as defined in Claim 7, wherein said third optical unit is an optical beam forming unit.
- 20 9. The laser irradiation apparatus as defined in Claim 8, wherein said optical beam forming unit is an optical element for making the intensity distribution of the beam uniform.
10. The laser irradiation apparatus as defined in Claim 9, wherein said second optical unit comprises at least two lenses.
- 25 11. The laser irradiation apparatus as defined in Claim 9, wherein said light source is a laser oscillator.
12. The laser irradiation apparatus as defined in Claim 9 further comprising at least a fourth optical unit in an optical path between said third optical unit and the target workpiece.

13. A laser irradiation method comprising;
producing a coherent beam from a light source;
adjusting said coherent beam using a first optical unit and a second optical
5 unit, said first optical unit being disposed in an optical path between said light source and the
target workpiece, and said second optical unit being disposed in an optical path between said
first optical unit and the target workpiece; and
irradiating the beam to said target workpiece;
wherein said first optical unit is disposed such that an entry point on said
10 second optical unit and a starting point of a pointing vector of the beam produced from said
light source are mutually conjugated with respect to said first optical unit.

14. The laser irradiation method as defined in Claim 13, wherein said second
optical unit is an optical beam forming unit.
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15. The laser irradiation method as defined in Claim 14, wherein said optical
beam forming unit is an optical element for making the intensity distribution of the beam
uniform.

20 16. The laser irradiation method as defined in Claim 13, wherein said first
optical unit comprises at least two lenses.

17. The laser irradiation method as defined in Claim 13 further comprising
adjusting the coherent beam using at least a third optical unit disposed in an optical path
25 between said second optical unit and the target workpiece.

18. The laser irradiation method as defined in Claim 13, wherein said target
workpiece is laser-machined in said irradiating the beam to said target workpiece.

19. A laser irradiation method comprising:
producing a coherent beam from a light source;
adjusting said coherent beam using a first optical unit, a second optical unit,
and a third optical unit, said first optical unit being disposed in an optical path between said
5 light source and the target workpiece, said second optical unit being disposed in an optical
path between said first optical unit and the target workpiece and said third optical unit being
disposed in an optical path between said second optical unit and the target workpiece; and
irradiating the beam to said target workpiece;
wherein said adjusting said coherent beam includes focusing said coherent
10 beam between said first optical unit and said second optical unit using said first optical unit
and wherein a focal point of said coherent beam and an entry point on said third optical unit
are mutually conjugated with respect to said second optical unit.

20. The laser irradiation method as defined in Claim 19, wherein said third
15 optical unit is an optical beam forming unit.

21. The laser irradiation method as defined in Claim 20, wherein said optical
beam forming unit is an optical element for making the intensity distribution of the beam
uniform.

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22. The laser irradiation method as defined in Claim 19, wherein said second
optical unit comprises at least two lenses.

23. The laser irradiation method as defined in Claim 19, wherein said light
25 source is a laser oscillator.

24. The laser irradiation method as defined in Claim 19 further comprising
adjusting the coherent beam using at least a fourth optical unit disposed in an optical path
between said third optical unit and the target workpiece.

25. The laser irradiation method as defined in Claim 19, wherein said target workpiece is laser-machined in said step of irradiating the beam to said target workpiece.